STATINTL

To : [redacted]

From : [redacted]

Date : July 20, 1964

Subject: Parachute and Actuators Being Presently Tested at El Centro

The following are the comments of [redacted] STATINTL

1. Thickness: If the thickness of the 'chutes, being tested, are measured in the same way that we have in the past, the thickness is about 6" to 6-1/4" vs the present 6-1/2 inches. This thickness has been reduced to 5" at the extreme lower end and gradually increases to a point approximately 6" up where the thickness is 6-1/4". Regardless of how the 'chutes are measured, it seems to me that the effective thickness is how far the pilot sits forward in the seat with one 'chute vs another.

   With this in mind a subject sat in the seat with the current 'chute and the knee location noted. The 'chute being tested was then put in the seat and the subject's knees were checked again.

   Results:

   a. With the current 'chute the knees were 7-3/8" from a reference point on the instrument point.

   b. With the 'chute now being tested the knees were the same distance from the same reference point.

2. Width: Again, on the 'chutes being tested, the width of the packed parachutes is considerably narrower than those in current use. This is contributing to the thickness being somewhat greater than anticipated.

3. A close look should be taken at the loop, grommet, and thong which acts as the deployment bag "hold-down". There are indications that the forces required to release the "hold-down" are higher than necessary.

△ FLIGHT SAFETY ITEM

On file USAF release instructions apply.

4. The bottom of the pack should have reinforcement added to protect against wear as well as forces involved during 'chute deployment.

5. The bottom end flap and the lower portions of the side flaps should be retailored to eliminate the high load concentrations in some areas and slack material in other areas.

6. The anchorages of the bottom cone and the next cone up should be modified to get rid of the ~~cockpit~~ cocking and extreme side loading.

7. We believe that the extreme tightness of the pack will cause excessive wear and weakening of fabric and seams which will mean very short service life.

8. "Sacrifice flaps" should be added (similar to those in current use),

9. The inner canopy flaps are excessively loose and we doubt if they will perform their intended function.

10. The pockets on the under rip cord flaps should be reinforced with webbing and be located directly opposite the spacings between the cones.

11. The edges of the holes in the cones should have a generous radius to eliminate excessive breaking of "pull up cords".

12. It is recommended that a close look be taken at the upper corner closures. Due to the high internal pressures our present assemblies have a tendency to "leak" and show canopy fabric in these areas under normal use.

13. Our present manual rip cord pull forces are high and due to the increased tightness of the packs being tested we assume that these rip cord pull forces are higher. (At this time no tests have been made to prove this assumption right or wrong.)

14. The shoulders on the main rip cord pins should be eliminated and replaced with a gradual taper. This will allow for improved seating of the eye on the power cable and help to eliminate the tendency for the pins to "back off".

ITEM 7 - - - PLUS QUESTIONABLE PACK INTEGRITY BEFORE REMOVAL FROM SERVICE.

15. The pockets on the lower end flap should be modified for easier accessibility and angle of force.

16. The nut plates (that project into the canopy compartment) should be covered to eliminate the possibility of damage to the canopy.

17. The pan cover installation should be modified to permit reasonable ease of installation and removal without disturbing the parachute pack.

△ * 18. No comments are being made regarding the drogue package until we have an opportunity to go over it more thoroughly.

△ 19

Parachute Actuators

△ 20 1. Further testing of the actuators and the pan should be done to determine the loads (under shock and sustained G conditions) that can cause the units to go into the armed position.

2. Lever arms and assembly linkage arms should be lightened as much as possible.

3. The ports for the dual cables should have a generous chamfer on the inner and outer faces.

kld
cc: Maj. H. Collins

* FIX PRIOR TO IN FLIGHT TESTS - ITEM 18 (LOOSENESS OF DROGUE PACK)

19. REEL BACK OF ROCKET JET FITTG - DROP-HEAD DOWN, 4TH TEST ON HARNESS - PEELED AT 5500 LB. WHIRL TOWER LOADS 6100, 7100 LBS IN OPPOSITE DIRECTION - OK

△ 20. - QUESTION VALIDITY OF 5500# DROP TOWER TESTS (MAIN) IN LIGHT OF 7100# @ 300K ON WHIRL TOWER.

STATINTL

TO:
FROM [redacted]

7-23-64

SUBJECT: PARACHUTE & SEAT TEST PROGRAM - EL CENTRO

1. TIMERS & INSTL.

A.- INADUERTENT ARMING

"TIMERS ARMED & FIRED TWICE - (DROP & WHIRL)

REC.-

CONDUCT SHOCK TEST AT PACIFIC SCIENTIFIC ON COMPLETE ASSEM. TO DETERMINE G FORCES TO ACTUATE

INCREASE DETENT IN R & RE-TEST TO CERTIFY FIX.

B.- CABLE SNAG

"CABLES ON DROGUE SNAG IN COIL SPRING ON REBOUND (TWICE)"

REC.-

DESIGN & QUALIF. TEST INTERNAL SLEEVE OR OTHER FIX (PACIFIC SCIENTIFIC)

C.- TIMER FAILURE

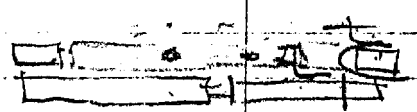
"TIMER (MAIN) FAILED TO FIRE ON DROP"

SEE PACIFIC SCIENTIFIC REPORT #101.

D.- TIMER ARMING LINKAGE & LOCK IN 'A'.

REC.- REDESIGN LINKAGE TO ELIMINATE SMALL DIA. ADJUSTING SCREW.

CENTER LINKAGE ON TIMER LEVERS. HAVE RED KNOB CABLE PULL ON MAIN LINK DIRECT, (FIREWALL)



DESIGN MECHANICAL LOCK IN 'A' - ON MAIN (PACIFIC SCIENTIFIC)

2.- PARACHUTE PACK ASSEM.

A.- "DROGUE RELEASE HOUSINGS KINKED ON DROP & WHIRL TESTS."

REC.- REDESIGN TO PRECLUDE - LONGER HOUSING, - -OR SWIVEL FITTINGS (FIREWEL)

B.- "SHOULDER BOARDS"

NOT USED UNTIL LIVE JUMPS.

REC.- ASSESS POSSIBLE NECK INJURY DURING JUMPS.

C.- RED KNOB DETENT

REC.- "INCREASE FORCE TO 7-10 LBS"

PRECLUDE INADVERTENT ACTUATION-

WORKED WELL ON 12 STATIC

(FIREWEL)

BACK END OF SPRING SEWN TO CORD.

3.- SEAT

A.- EMERG. OXYGEN CABLE
ROUTING OF CABLE TO RAIL
TIE DOWN NOT CLEAN-
REC.- INVESTIGATE FOR IMPROVEMENT (ADP)

B.- THRUST LINE VS C.G.
LOOKED GOOD ON 1ST STATIC
REC.- MUST BE WATCHED CLOSELY ON IN FLIGHT TESTS (ADP)

C.- ACCELERATION & G'S - LAUNCH
SURVIVAL KIT DAMAGE - LOOKED LIKE COMPRESSION FAILURE - TO RH TIE DOWN STRAP AREA - BOX & LID - AND ALSO ON RH LEG EXTENSION. (IN WORKING CONDITION)
REC.- GET GOOD, ACCURATE G FORCES FROM ACCELEROMETER & FILM ON 2ND STATIC (BEING DONE)

D.- SEPARATION
LOOKED GOOD ON 1ST STATIC.
REC.- BEST YET. IF NO TROUBLE SHOWS ON REMAINING TESTS - RETROFIT A.S.A.P. (FIREWEL)

E.- CATAPULT HOSE DISCONNECT
SMOKE MARKS ON DROGUE PACK FROM 1ST STATIC. NO BURNS.
REC.- CLOSE SCRUTINY ON REMAINING TESTS.-
REDESIGN TO DEFLECT AFT (ADP)

F.- VENT HOSE DISCONNECT
SQUEEZED HARD BY CHUTE.
REC.- NEEDS REVIEW - INVESTIGATE BY ADP & FIREWEL.

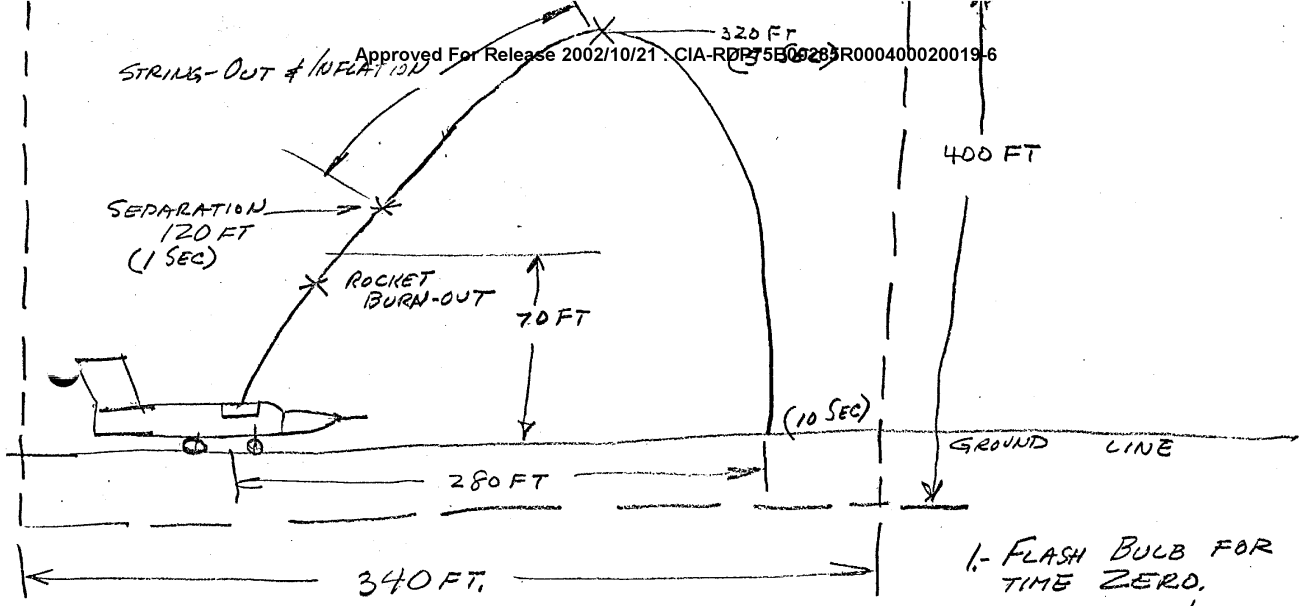
4. TEST DATA

SOME TEST DATA HAS BEEN RECIEVED THUS FAR. *

HARRY COLLINS REPORTS THAT ALL DATA RECIEVED THUS FAR HAS BEEN GIVEN TO US, AND THAT WE WILL GET IT AS SOON AS IT IS PROCESSED.

SPIN ON THE DROGUE WAS OBSERVED ON WHIRL TESTS & ON ONE DUMMY DROP WHERE SPIN AT LOW ALTITUDE (4000-5000 FT) WOUND UP THE LINES & COLLAPSED THE DROGUE. LOW ALTITUDE ON THE DROGUE IS NOT VALID BUT ABOVE 15M FT COULD BE CRITICAL. FORTHCOMING HIGH ALTITUDE JUMPS WILL ALSO CHECK THIS CONDITION.

* HAVE WHIRL TOWER DATA.
HAVE PHOTO'S OF DROP TOWER.
HAVE 1ST STATIC 16 MM FILM
HAVE B-66 DROP CLOBBER DATA



1.- FLASH BULB FOR TIME ZERO.

2.- NO TRUCKS/VEHICLES IN VIEW.

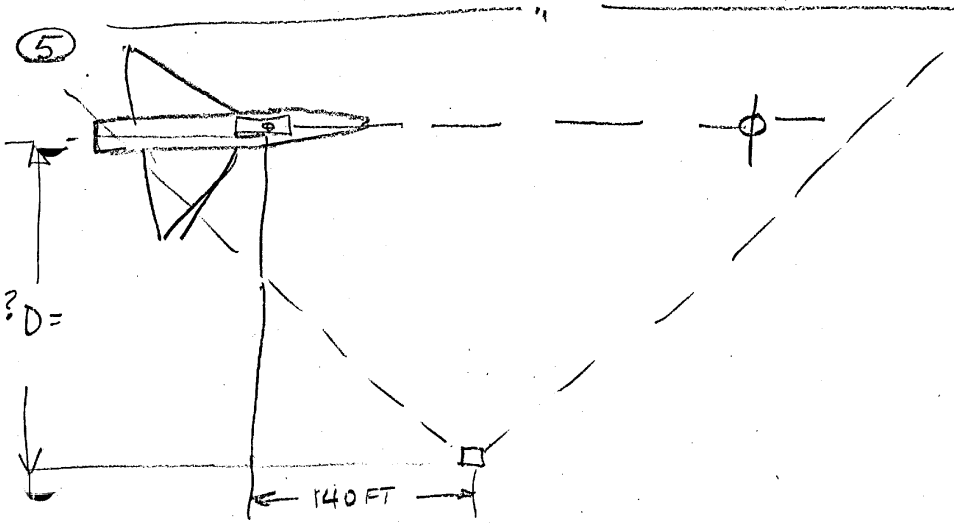
(1) TRAJECTORY CAMERA'S -(2) FIXED. 200 FRAME/SEC ? 20 F/S HULCHER ?
(340' x 400' HIGH)

(2) CLOSE UP CAMERA - FIXED
A.- HULCHER 20 FPS, FROM 0 TO BURN-OUT, (70 FT)
(FOR ACCELERATION & THRUST)

(3) CLOSE UP CAMERA'S - HAND PANNED
A.- LAUNCH - BURN-OUT - SEPARATION - STRING OUT - INFLATION - TOUCH DOWN.
(FOR DETAIL ON ROTATION - BELTS COMING LOOSE, ETC)

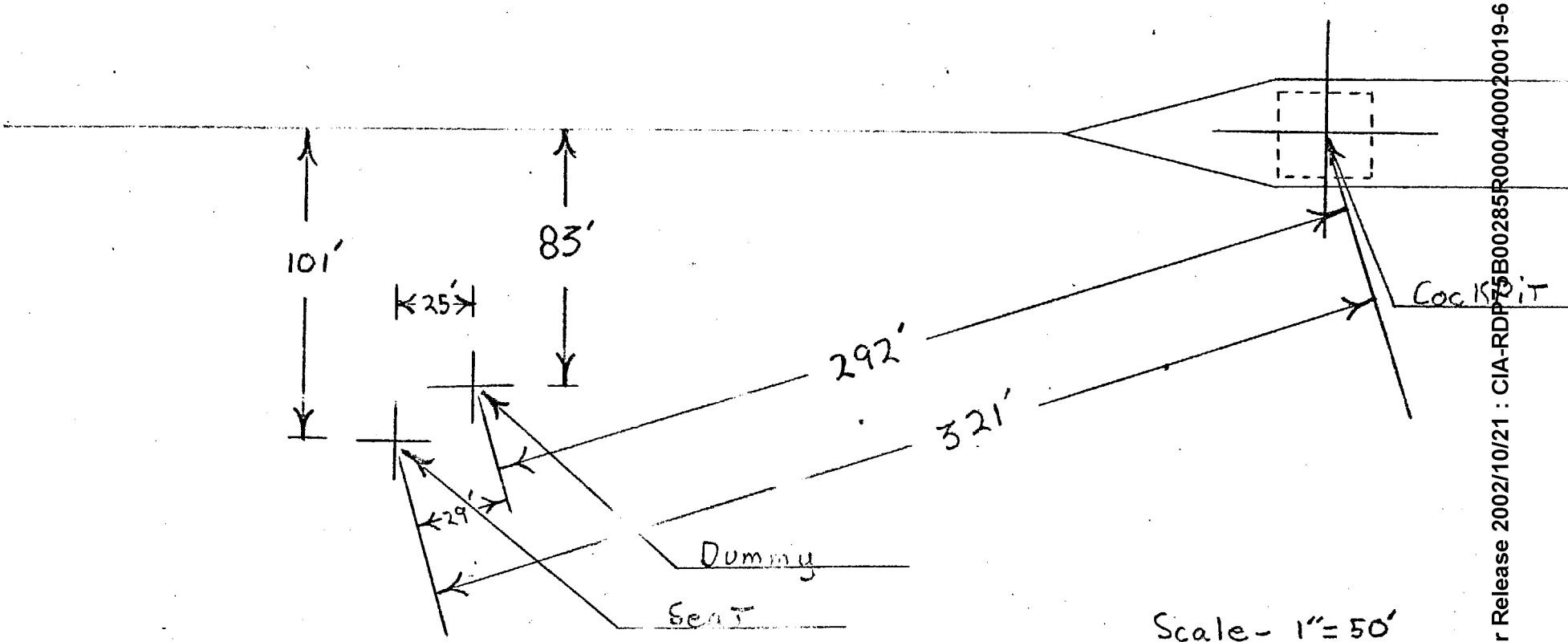
(4) FOLLOW DUMMY & CHUTE - NOT SEAT

(5)



1ST Static Ejection Seat Test

22, July, 1964



Scale - 1" = 50'

Estimated Dummy Height (From Movies) = 300 FT

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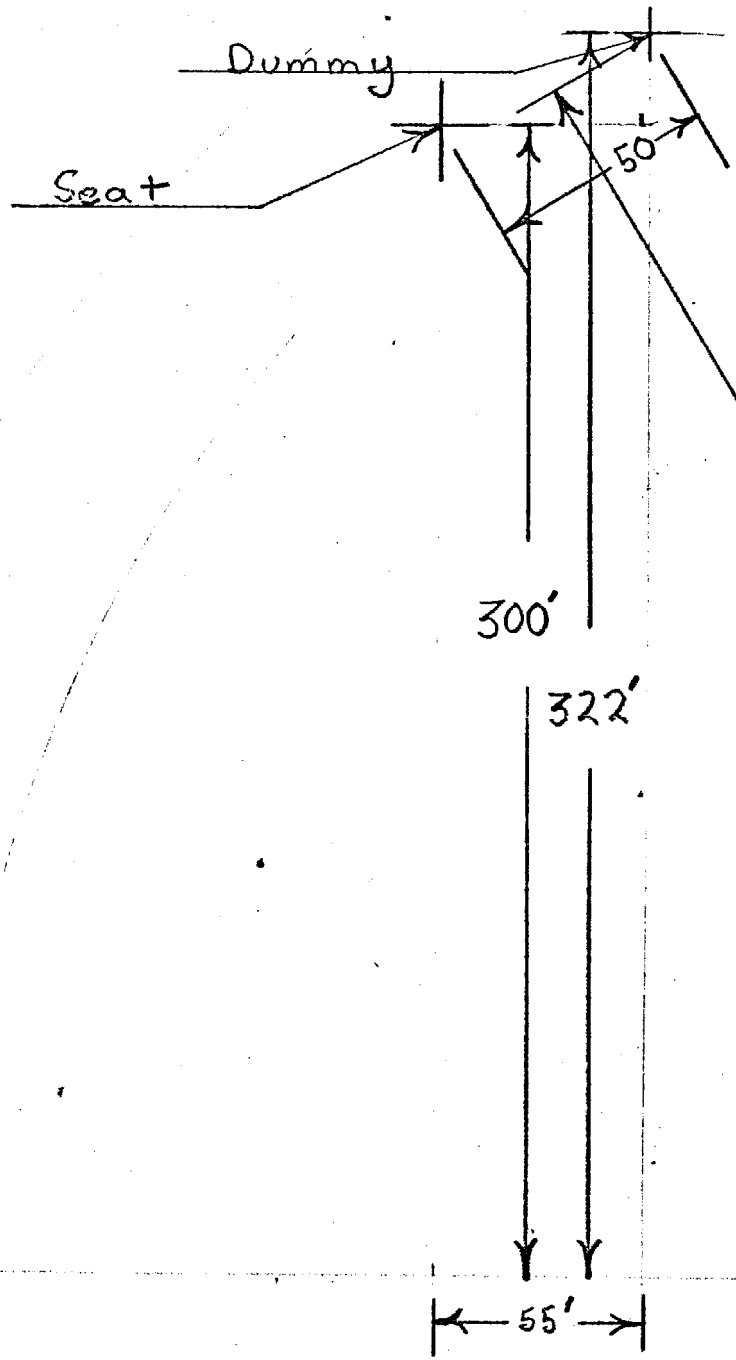


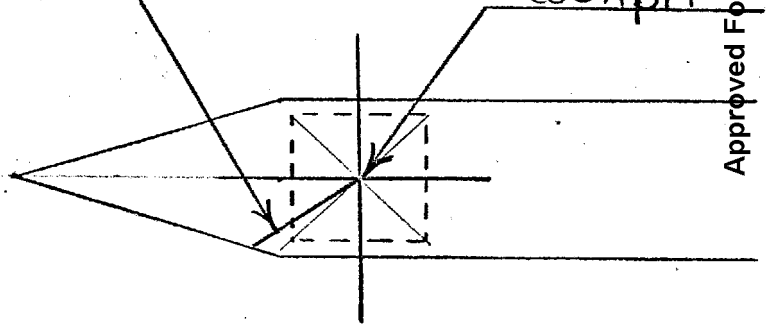
2nd Static Ejection Seat Test

30, July, 1964

375'

Scale - 1" = 50'

Estimated Dummy Height (From Hulcher) = 419 ft.



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